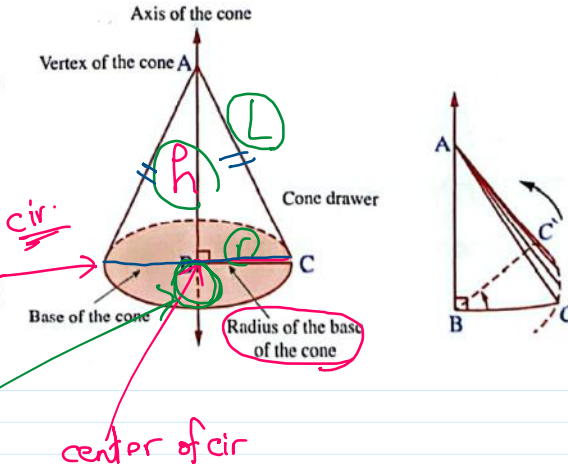


The right circular cone

Is the solid formed from the rotation of a right-angled triangle with complete rotation about one of its right sides as an axis or is the space formed from the folding of a circular sector where their two radii coincide on each other.

In the opposite figure :

ΔABC is right angled triangle at B, if it is rotated about the axis \overline{AB} with a full turn, the formed solid is called right circular cone, and the point A is called vertex of the cone, \overline{AC} is the drawer of the cone, \overline{AB} is axis of the cone, surface of circle B is the base of the cone.



$$L = \sqrt{h^2 + r^2}$$

$$h = \sqrt{L^2 - r^2}$$

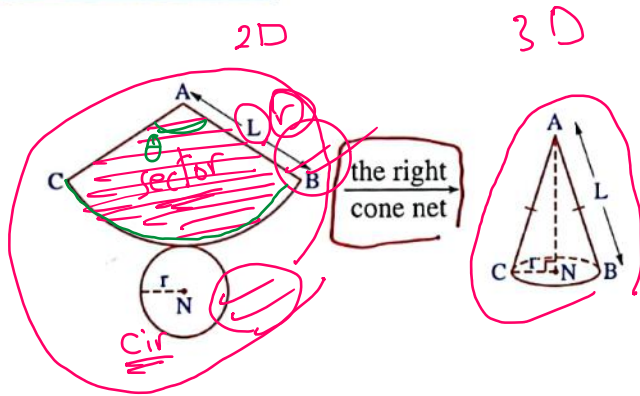
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$$L = \theta^{\text{rad}} \cdot r$$

$$A = \frac{\theta}{360} \pi r^2 \quad \theta \text{ degree}$$

$$A = \frac{1}{2} \theta^{\text{rad}} r^2 \quad \theta \text{ radians}$$

The right cone net :



Remember

One of the right circular cylinder nets

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Remember that

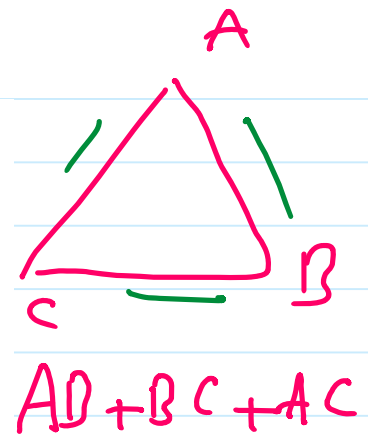
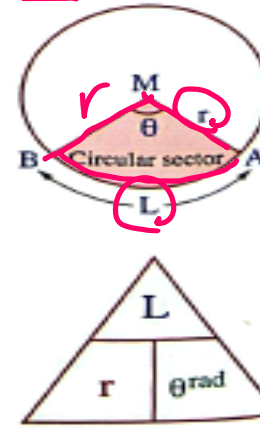
The circular sector is a part of the surface of a circle bounded by two radii and an arc of the circle.

* Area of the circular sector = $\frac{1}{2} L \cdot r$
 (where L is the length of the arc of the sector)

* Area of the circular sector = $\frac{1}{2} \theta^{\text{rad}} r^2$ (where θ^{rad} is the radian measure of the sector angle)

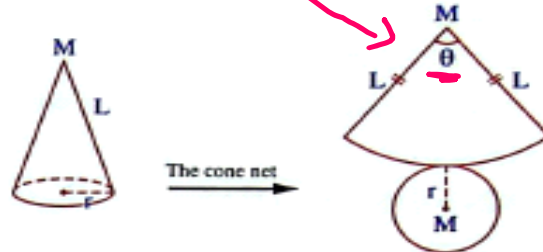
* Area of the circular sector = $\frac{\mathcal{X}^\circ}{360^\circ} \times \pi r^2 = \frac{\mathcal{X}^\circ}{360^\circ} \times \text{area of the circle}$
 (where \mathcal{X}° is degree measure of the sector angle)

* Perimeter of the sector = $2r + L$ length unit.

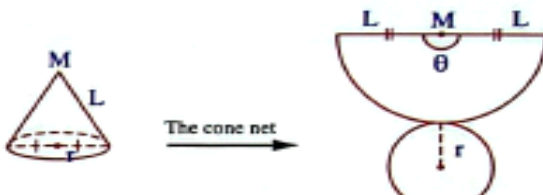


Important remarks

(1) If $L > 2r$, then the cone net as shown, $0^\circ < \theta < 180^\circ$



(2) If $L = 2r$, then the cone net as shown, $\theta = 180^\circ$



(3) If $L < 2r$, then the cone net as shown, $180^\circ < \theta < 360^\circ$



The lateral area - total area - volume of a right cone :

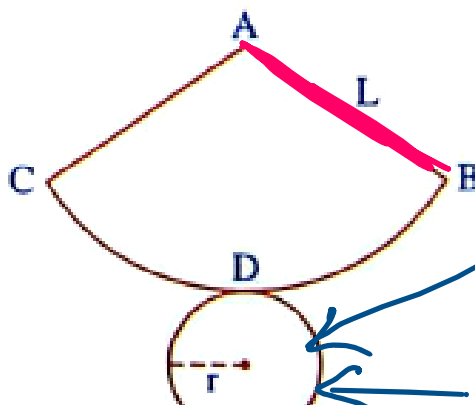
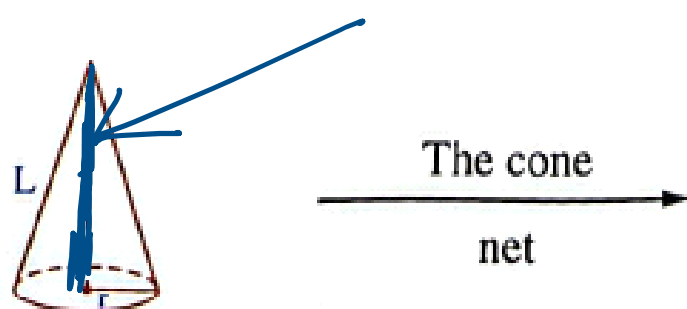
If (r) is the radius of the cone base, (L) is the cone slant height, (h) is the height, then :

• The lateral surface area (L.S.A.) of the right cone = $\pi L r$

• The total surface area (T.S.A.) of the right cone = $\pi r (L + r)$

• Volume of the right cone = $\frac{1}{3} \pi r^2 h$

Handwritten notes: $\pi L r$ (circled), $\pi r (L + r) = \pi L r + \pi r^2$ (circled), $\frac{1}{3} \pi r^2 h$ (circled). Below these is $\frac{\pi L r}{\text{L.S.A.}} + \frac{\pi r^2}{\text{base area}}$.





Cone_3

Thursday, December 4, 2025 7:55 AM

$$r = 6$$

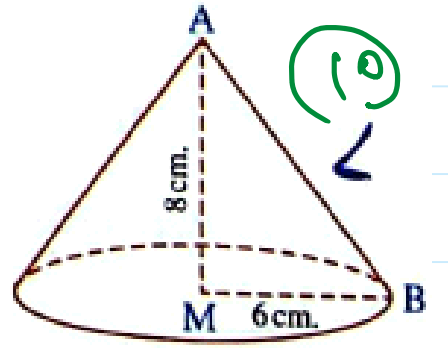
$$h = 8$$

A right circular cone, the length of its base diameter is 12 cm. and its height is 8 cm. find :

(1) The L.S.A.

(2) The T.S.A.

(3) The volume.



$$L = \sqrt{8^2 + 6^2} = 10$$

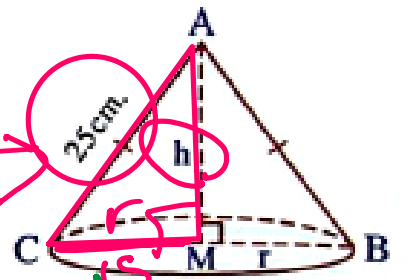
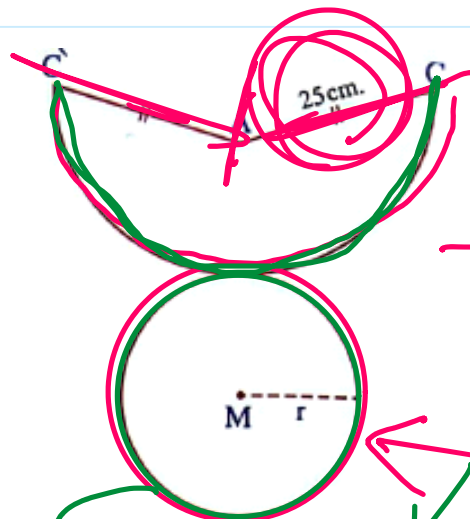
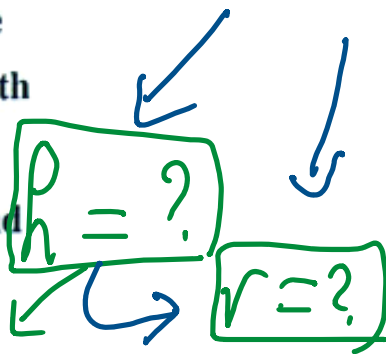
$$L.S.A = \pi L r = 60\pi \text{ cm}^2$$

$$T.S.A = L.S.A + \pi r^2 = 60\pi + 36\pi = 96\pi \text{ cm}^2$$

$$V = \frac{1}{3} \pi r^2 h = \checkmark$$

Use the opposite net to describe the formed solid and if the length of the arc $\widehat{CC} = 30\pi$ cm. Find the volume of this solid and its total surface area.

$$L = 25 \text{ cm}$$



Per. of cir
Circumference of cir.

$$V = \frac{1}{3} \pi r^2 h$$

$$T.S.A = \pi r L + \pi r^2$$

$$\frac{30\pi}{2} = 2\pi r$$

$$r = 15 \text{ cm}$$

$$h = \sqrt{25^2 - 15^2} = 20 \text{ cm}$$

A pure gold alloy as a right cone of radius length 3 cm. and lateral surface area = 15π cm². Find the gold density if the mass of the alloy = 727 gm. " $\pi = 3.14$ "

$$L.S.A = 15\pi \text{ cm}^2$$

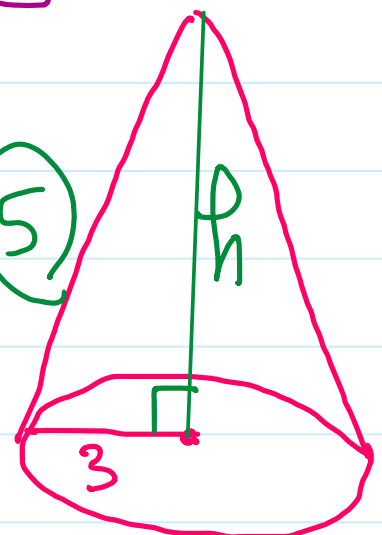
$$L.S.A = \pi L r$$

$$h = \sqrt{L^2 - 3^2}$$

$$4 \text{ cm}$$

$$\frac{15\pi}{3} = \pi L \times 3$$

$$L = 5$$

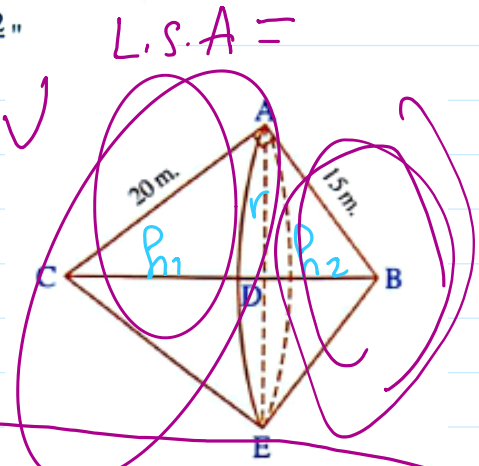
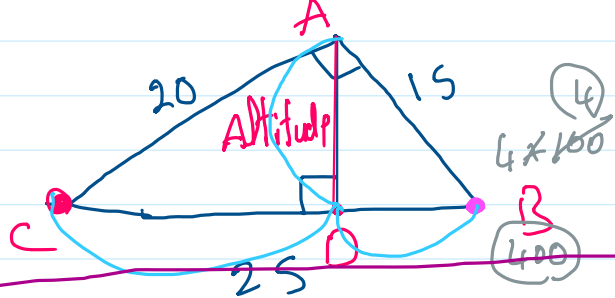


$$d = \frac{\text{mass}}{V} = \frac{727}{15\pi}$$

$$V = \frac{1}{3} \pi L r^2 = \frac{1}{3} \pi \times 5 \times 9 = 15\pi \text{ cm}^3$$

ΔABC is right-angled at A, $AB = 15$ m, $AC = 20$ m, if the triangle is rotated a complete rotation around \overline{BC} , describe the formed solid, then find the cost of painting this solid with a material resistant to erosion, if the cost of one square metre = 10 pounds and find the volume of this solid. " $\pi = \frac{22}{7}$ "

$$BC = \sqrt{20^2 + 15^2} = 25 \text{ cm}$$



$$AC^2 = CD \cdot CB \quad \text{--- (1) } \frac{20^2}{25} = h_1 \cdot \frac{25}{25} \quad h_1 = 16 \text{ cm}$$

$$AB^2 = BD \cdot BC \quad \text{--- (2) } \frac{15^2}{25} = h_2 \cdot \frac{25}{25} \quad h_2 = 9 \text{ cm}$$

$$AD^2 = DB \cdot DC \quad \text{--- (3) } \sqrt{r^2} = \sqrt{9 \cdot 16} \Rightarrow r = 12 \text{ cm}$$



shape 1	shape 2
$L_1 = 20$	$L_2 = 15$
$r_1 = 12$	$r_2 = 12$
$h_1 = 16$	$h_2 = 9$